

# Results from Fielding of the Bio-Surveillance Analysis, Feedback, Evaluation and Response (B-SAFER) System in Albuquerque, New Mexico

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*Public health authorities need a surveillance system that is sensitive enough to detect a disease outbreak early to enable a proper response. In order to meet this challenge we have deployed a pilot component-based system in Albuquerque, NM as part of the National Biodefense Initiative (BDI). B-SAFER gathers routinely collected data from healthcare institutions to monitor disease events in the community. We describe initial results from the deployment of the system for the past 6 months.*

## INTRODUCTION

In order to meet the goal of surveillance for early detection and rapid public health response, we have identified a robust number of non-traditional data streams from different healthcare enterprises in a metropolitan area. To integrate data, we have used a distributed, component-based system with industry-standard architecture (OpenEMed)<sup>1</sup>. In addition, where possible, the system conforms to National Electronic Disease Surveillance Standards (NEDSS) developed by CDC. A medical epidemiologist reviews incoming data to identify potential disease outbreaks and relationships between data sets. We provide situational awareness and early warning to the medical and public health community. The system is designed to assure adherence to privacy standards and to enable evaluation of the independent and collective utility of data streams.

## APPROACH

We surveyed the community for relevant data sets and methods to capture data in "near real-time". We worked with each institution providing data to capture the data, obtain IRB approval and assure HIPAA compliance. The methodology is generic but tuned for each organization and involved capturing SQL, HL7, text, and XML data sets. Incoming data is compared to historical data (when available) to provide near-real-time analysis and notification. We acquire the data in such a way that we can deduplicate events dynamically as they arrive, because the event may change over time resulting in it being sent more than once. Statistical techniques include baseline characterization, time series modeling, and outlier detection). These analytic tools have been integrated into the overall architecture to form the, open-source B-SAFER system.

## RESULTS

Health related data is being obtained from: 3 of 5 hospital systems, which include clinical data elements from 4 of 9 local emergency departments (ED) and Admission Discharge Transfer logs from 1 of 5 hospital EDs. Requests for lab tests for patients seen in the ED are obtained from one hospital. A pre-hospital dispatch code limited clinical data and hospital utilization data is obtained from Albuquerque Ambulance Service and EM Systems. Calls for medication information are obtained from the regional Poison Center. Syndromic surveillance death reports are obtained from the NM Office of the Medical Investigator. Patient privacy is protected by limiting transfer of personal information and by encrypting all transferred unique patient identifiers at the originating institution. Analyzed data and displays are reviewed daily by a medical epidemiologist and investigated as appropriate. Patient identities can be revealed to the NM Department of Health (NMDOH) when necessary for public health investigation by contacting the epidemiologist or infection control practitioner at the originating institution. The BDI testbed operated December 10-13 2002; data collection continued through May 2003. Total respiratory complaints increased and decreased during Jan.-March in parallel with influenza surveillance data and results of respiratory viral testing reported from local labs. An increase in gastrointestinal complaints was seen during a time that rotavirus activity in the community was documented by test results.

## CONCLUSIONS

B-SAFER is the result of a partnership of LANL, UNM-Health Sciences Center, and NM Dept. of Health – Office of Epidemiology. The eventual goal is to develop a modular, scalable information system that can be integrated into a national surveillance system such as the Public Health Information Network (PHIN) of the CDC.

## References

- <sup>1</sup> D. Forslund, J. George, "A Service-based Approach to Integrating Epidemiological Information in Public Health Departments", AMIA 2002 Fall Symposium